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The resilience and vulnerability of remote mountain communities: The case of Vent, Austrian Alps

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ABSTRACT

Building on critical community resilience studies, this study analyses the resilience of the village of Vent, a remote mountain community in the Austrian Ötztal valley challenged by slow-onset disturbances such as climate change, outmigration of young people and the repercussions of the post-2008 recession. A conceptual framework which focuses on how well economic, social, cultural, political and natural domains are developed within a community, is used as the conceptual springboard to assess the resilience of Vent. The study highlights that Vent is facing substantial resilience challenges and that the community is particularly vulnerable (weak resilience) with regard to the political and natural domains, is only moderately resilient in economic and social terms, and that only the cultural domain emerges as strongly resilient. Overall, Vent is, at most, moderately resilient in the face of continuing and future shocks/disturbances. The study interrogates current resilience frameworks and suggests that an approach based on the five resilience domains provides a richly textured framework for understanding the subtleties of resilience pathways, all the while acknowledging that obtaining a relatively complete picture of resilience is easier in small (and geographically bounded) communities.

1. Introduction

There is now a plethora of emerging work on community resilience. The generally accepted definition of community resilience is the capacity of a community to absorb disturbance and reorganize while undergoing change to still retain essentially the same function, structure, identity, and feedbacks, whereby resilience is often assessed by the size of the displacement the system can tolerate and yet return to a state where a given function can be maintained (Walker and Salt, 2006). Cumming et al. (2005, 978) further argued that "if system identity is maintained over the time horizon of interest under specified conditions and perturbations, we can term the [community] system resilient" Walker and Salt (2006) distinguished between three different aspects of resilience (persistence, adaptability, transformability). In this view resilient communities[1] should have the capacity to buffer shocks and conserve existing functions and structures in the face of disturbances (persistence), should be able to reorganise and learn within the current system (adaptability, adaptive capacity) and should have the capacity to create a new trajectory rooted in radical change (transformability). This highlights that resilient communities have a diversity of responses and are often multifunctional, i.e. they have multiple and overlapping development pathways that allow them to remain stable (resilient) (Wilson, 2010). The role of learning is key for resilient communities, and the new system that may emerge after a shock will often be qualitatively different from the previous system (Davidson, 2010). Shocks and disturbances can, therefore, also be positive (window of opportunity), forcing a community to implement transformative change.

Critical studies have highlighted various issues surrounding resilience processes and how to assess them, for example including critiques of the often implied linearity of resilience pathways (Wilson, 2012; Wilson, 2017); the question whether human systems necessarily need revert back to their original starting point after a disturbance

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[1] There has been substantial debate about the meaning and constituents of the notion of 'community', especially whether communities should be regarded as 'open' and 'unbounded' systems rather than 'closed' spaces (Wilson, 2012). In this study, 'community' will be understood as a social network of interacting individuals, concentrated into a defined territory – i.e. a community as the totality of social system interactions, as an affective unit of belonging and identity, a space of human connectedness to a place of physiological condition, and as a network of relations within a defined geographical space. The discussion will focus on the resilience of a geographically-bounded community (see below) with which residents can more-or-less identify, all the while acknowledging that there are many different communities within such spaces, embedded in complex networks of power and with often highly divergent aims related to resilience (Wilson, 2012). The notion of 'community' in this sense does not only include long-standing residents but also newcomers and migrants who all contribute to what makes up the case study community.

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(Davidson, 2010); the role of social memory and path dependencies in resilience processes (Olick and Robbins, 1998; Stump, 2010); questions about what resilience is measured and for whom resilience should be assessed (Anderson, 2015; Allen et al., 2016); methodological discussions about the subjectivity of some resilience indicators (Bene, 2013; Bene et al., 2015; Jones and Tanner, 2015; Sharifi, 2016); and conceptual and theoretical discussions about which components, indicators or domains of resilience should be selected for study (e.g. Emery and Flora, 2006; Wilson, 2012; Kelly et al., 2015). While much work is now available on fast-onset disturbances such as natural catastrophes and their impacts on communities (e.g. Kates et al., 2006; Duffield, 2012), there are fewer studies that have investigated the impact of slow-onset disturbances on human communities, especially with regard to less clearly delineated anthropogenic disturbances such as economic recessions or social change (see Cannon and Müller-Mahn, 2010; Martin, 2012; Wilson, 2012; Brassett et al., 2013, for notable exceptions).

In order to address this gap, this study will analyse the resilience of Vent, a remote mountain community in the Austrian Alps. Resilience will be assessed by referring to several natural and anthropogenic slow-onset disturbances, including climate change and economic, social, political and cultural change. These disturbances represent examples of a wide range of possible disturbances currently facing mountain communities in the European Alps. The focus of this study will be on understanding resilience processes themselves and how the community may or may not be able to adapt to change. This study will build on the conceptual framework outlined by Emery and Flora (2006) and Kelly et al. (2015) which suggests that communities are most resilient when social, economic, cultural, political and environmental domains are well developed (Fig. 1). Communities where one or more of the domains are less well developed tend to be vulnerable, i.e. vulnerability is seen here as the antithesis of resilience akin to a 'strong' and normative notion of resilience (Wilson, 2012, 2017). The five domains, thus, provide the basis for the structure of the analysis below, and their relative importance is illustrated through the example of various disturbances highlighted above.

Remote mountain communities in the European Alps, situated either in very remote locations and/or at high altitudes over 1500m, provide particularly apt resilience/vulnerability case studies as they face multiple overlapping disturbances (e.g. Meleghy et al., 1980, 1982; Scharr, 2001, 2013). First, many studies have shown that the impacts of climate change on communities are more pronounced in mountain environments (e.g. Fuchs, 2009; Luthe et al., 2012; Hill, 2013; Koch and Erschbamer, 2013; see also in particular the special issue in 'Mountain Research and Development' 35(2)). Second, almost all remote mountain communities in the European Alps have faced substantial socio-economic change over the past decades, including a relative weakening and withdrawal of farming in marginal areas, an overdependence on tourism as the main form of income (in particular skiing), but also socio-economic changes linked to outmigration of young people and associated loss of social memory and cultural changes (Zucca, 2006). The emerging complexity points towards an increasingly blurred divide between drivers of, and responses to, resilience. Thus, while climate change is a key *driver* of resilience/vulnerability, processes such as youth outmigration are *both* a driver for, as well as a response to, reduced community resilience (Wilson, 2012). As the next section will discuss, such self-reinforcing cycles of resilience drivers/responses are methodologically challenging. Third, several studies have highlighted that, due to their remoteness and need for self-sufficient livelihoods (at least until the recent past) remote mountain communities can be more inward looking and conservative, making it more difficult for policy-makers to effect changes in community perceptions and behaviours (Scharr, 2001; Zucca, 2006).

Fig. 1. Conceptual framework for analysing community resilience. (Source: authors, after Emery and Flora, 2006; Kelly et al., 2015)

A key focus in this study will be placed on understanding resilience transitions based on the assumption that transitional pathways do not exist in a vacuum but are interlinked with complex antecedent histories (Wilson, 2012). This implies that accumulated wisdom, experience and knowledge are passed on within a community and that any community system will be at a specific starting point because of the history of decision-making trajectories *preceding* that starting point (Stump, 2010). In other words, a community carries with it the memory of previous decision-making trajectories, whereby social memory acts as a crucial transitional element which can lead to an *adjustment* and *learning* phase based on past experience.

2. Methods

The small village of Vent in the Ötztal (Tirol, Austria; 140 inhabitants, 6 remaining farms; Fig. 2) was selected as a case study community for this study for four key reasons. First, its remoteness and altitude (at 2000 m the highest permanently inhabited community in the Eastern Alps) mean that Vent is typical for a community living at the extreme edge of 'liveable space' in the European Alps, often cut-off by avalanches (until the recent past) and having to rely on endogenous resources to survive harsh winters. Second, like many Alpine communities Vent has witnessed dramatic socio-economic and cultural changes over the past 100 years which have made the community more vulnerable (Meleghy et al., 1982; Scharr, 2013). Vent has a very high dependency on tourism as its main income stream and is also characterised by pronounced levels of outmigration by young people and an ageing population (the notion of 'community' used in this study, thus, also includes permanent and temporary residents). Third, Vent and adjacent communities were part of the large-scale and widely cited UNESCO 'Man-and-Biosphere' programme in the 1970s/80 s which provides a good baseline with regard to some of the key resilience dimensions investigated in this study, especially with regard to socio-economic drivers of change (see in particular Meleghy et al., 1980, 1982). Fourth, this study was undertaken in close collaboration with the Department of Sociology at Innsbruck University (Austria) who were able to provide invaluable information about the area and facilitated the selection of key stakeholders for interview.

Building on critical community resilience research (e.g. Bene, 2013; Bene et al., 2015; Sharifi, 2016; Allen et al., 2016), a multi-method approach was adopted that included multiple methodological strands. First, 51 in-depth interviews (lasting between 30 and 90 min) were undertaken with locals and regional decision-makers (39 locals; 12 regional stakeholders; Table 1) whose selection was based on preliminary identification of key stakeholder groups (e.g. farmers; tourist businesses; local/regional decision-makers). The 39 local respondents represented almost a third of the total population of the village, which meant that a relatively full picture of resilience patterns, processes and

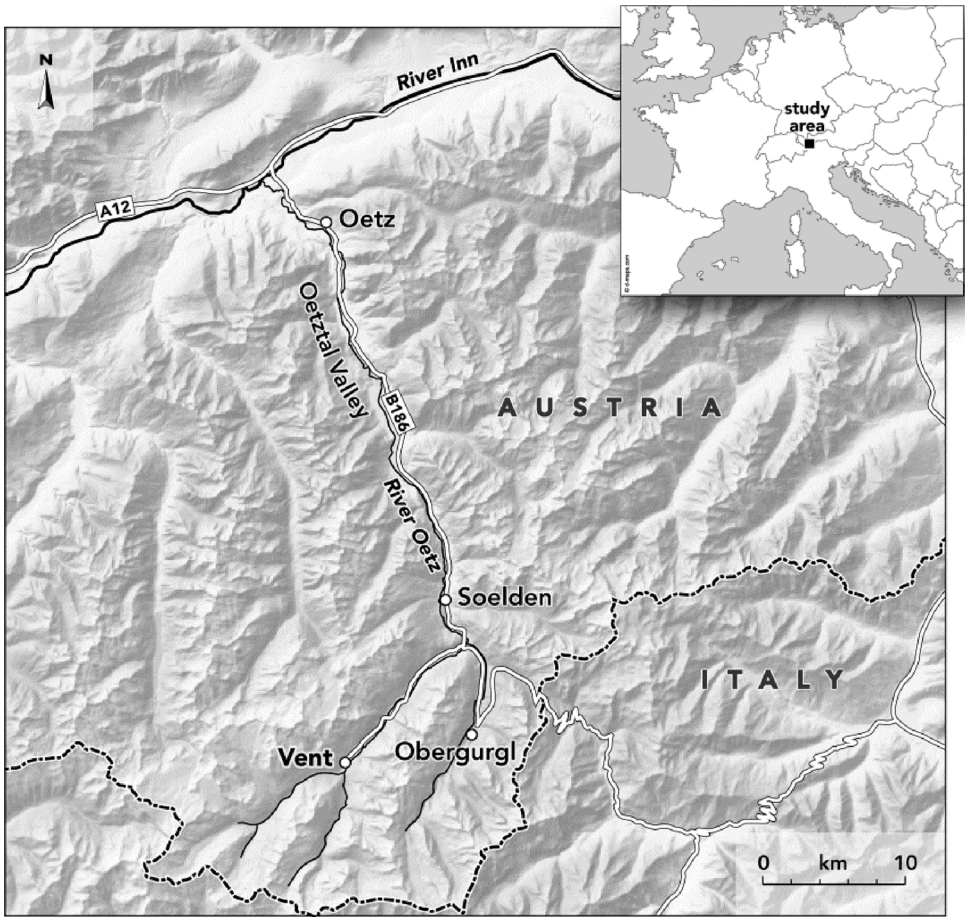

Fig. 2. Location of the case study community of Vent and the Ötztal (Tirol, Austria) (Source: authors).

Table 1
Range of stakeholders selected for interview (Source: authors).

Stakeholder	Numbers interviewed	Local (Vent)	Regional
Elderly resident	9	X	
Hotel owner	8	X	
Resident	7	X	
Farmer (also resident)	6	X	
Mountain guide	2	X	
Mountain hut manager (also resident)	2	X	
Hotel worker (also resident)	1	X	
Hunter (also resident)	1	X	
Tourist business owner	1	X	
Shop owner	1	X	
Ski lift manager (also resident)	1	X	
Tourism representative/manager	3		X
Academic	3		X
Camping owner	1		X
Local historian/cultural critic	1		X
Mayor	1		X
Water company representative	1		X
Energy company representative	1		X
Infrastructure manager	1		X
	51	**39**	**12**

issues could be obtained and that responses could be easily cross-referenced and checked for consistency and accuracy. Interviews were semi-structured and used a flexible approach where respondents were allowed to expand on themes of interest. Interview material was transcribed and coded by variables and by whether statements fell into categories of strong, moderate or weak resilience (weak resilience = strong vulnerability) based on resilience variables listed in Table 2 below. Second, participant observation provided important insights into the day-to-day activities of the community. The main researcher lived with a farm family in Vent for 10 weeks in the winter of 2015/2016. Building on authors such as Kinsbaisby-Hill (2008) and Wynne-Jones et al. (2015), participant observation involved the researcher moving between participating in the community by deliberately immersing himself in its everyday rhythms and routines, developing relationships with people who could explain what was going on in the community, and writing accounts in a field diary of how these relationships developed and what was learned from them. Participant observation, thus, focused on studying everyday events and how they were experienced and understood by participants, helped investigate social events and non-verbal interactions, and helped link data to reality, i.e. understanding what people were doing rather than just interpreting what they were saying (Wynne-Jones et al., 2015). Field diary notes were treated as 'raw data' (Wynne-Jones et al., 2015) and analysed as a textual document focusing on recorded impressions, feelings and comments. Third, archival information was collected to analyse historical path dependencies, with a key focus placed on the new 'social memory' archive opened in the Ötztal valley in 2013 which contained valuable photos, letters and diaries that also included stories from the village of Vent.

Questions about the resilience/vulnerability of Vent used slow-onset disturbances as examples of shocks that affect many remote mountain communities including climate change, the post-2008 economic recession, the impact of outmigration of young people from the community, and impacts of tourism on cultural integrity. As Table 2 highlights, this involved selection of both 'subjective' and 'objective' variables to assess resilience. The selection of these variables builds on recent critical resilience studies that have discussed in detail qualitative, quantitative as well as subjective/objective means to assess resilience. In particular,

Table 2
Variables and main methods used for assessing objective and subjective resilience indicators.
(Source: authors, after Wilson, 2012; Bene et al., 2015; Kelly et al., 2015; Jones and Tanner, 2015; Sharifi, 2016; Cutter et al., 2016)

Resilience indicator	Main methods used	Objective/Subjective assessment
Social factors		
Outmigration of young people	Secondary	Objective
Community health/life expectancy/educational levels	Secondary	Objective
Inter and intra-community networks	Observation/interviews	Subjective
Stakeholder interaction	Observation/interviews	Subjective
Ability to rely on neighbours at times of crisis	Interviews/observation	Subjective
Communication between stakeholder groups	Observation/interviews	Subjective
Ability of community to accept change	Interviews/observation	Subjective
Gender roles/role of ethnic and religious groups	Interviews/observation	Subjective
Control over development trajectories	Interviews	Subjective
Stakeholder perceptions of community	Interviews	Subjective
Happiness	Observation/interviews	Subjective
Cultural factors		
Rites	Observation/interviews	Subjective
Traditions	Observation/interviews	Subjective
Taboos	Observation/interviews	Subjective
Passing on skills to next generation	Interviews	Subjective
Economic factors		
Wealth of community	Secondary	Objective
Infrastructure	Secondary	Objective
Diversified income sources/pluriactivity	Secondary/interviews	Objective
Dependence on external income sources	Secondary/interviews	Objective
Service provision (shops, doctor, school, etc)	Secondary	Objective
Good and transparent land ownership rights	Interviews/secondary	Objective
Impact of globalization	Interviews/secondary	Subjective
Corruption	Interviews	Subjective
Political factors/governance/institutions		
Governance structures	Interviews/secondary	Objective
Leadership	Interviews	Subjective
Institutional thickness	Secondary/interviews	Subjective
Transparency of decision-making	Interviews	Subjective
Role of media	Interviews/secondary	Subjective
Power	Interviews	Subjective
Natural factors		
Biodiversity	Secondary	Objective
Soil management	Interviews/secondary	Objective
Water management	Secondary	Objective
Energy supply	Secondary	Objective
Impact of climate change (skiing; agriculture)	Secondary	Objective

recent work by Kelly et al. (2015), Wilson (2012) and Wilson et al. (2016) has shown that specific variables can be identified that can be used to assess resilience at community level, and these formed the basis for the selection of variables listed in Table 2. In addition, work by Bene et al. (2015) was instructive with regard to how to assess resilience before and after shocks, Sharifi (2016) has provided a comprehensive and useful list of assessment tools for resilience, while Cutter et al. (2016) showed how quantitative resilience data can be used for analysis of community resilience. Jones and Tanner's (2015) analysis of measuring 'subjective resilience' using respondent perceptions to quantify community resilience also proved useful for selecting variables (although their study focused on the resilience of households).

These studies suggest that objective resilience variables include those where there is relatively little debate as to the 'direction' of impact of the variable on resilience (e.g. a snow avalanche is uncontested as a factor that affects community resilience), while subjective variables include those where interpretation of impact is highly dependent on cultural norms and positionality of those doing the interpreting (e.g. a commonly contested variable is the role of ethnic/immigrant/religious groups in either raising or lowering community resilience) (Wilson, 2012; Kelly et al., 2015; Jones and Tanner, 2015). Critical studies have highlighted that many economic and natural indicators tend to be more universally accepted (i.e. objective) as showing attributes of either resilience or vulnerability, while indicators linked to social, cultural and political factors often tend to be more subjective and based on culturally dependent notions of what is 'good' or 'bad' for resilience (see in particular Wilson, 2012; Jones and Tanner, 2015; Kelly et al., 2015; Sharifi, 2016). Table 2 shows key variables used to assess resilience in this study, the main methods used to obtain information, and whether interpretation of the variables emerging from the interviews was based on objective or subjective assessments of resilience.

3. Analysis

3.1. The economic domain

This section focuses on understanding key variables within the economic domain affecting the resilience of the community of Vent. Building on studies such as Wilson (2012), Bene et al. (2015), Kelly et al. (2015) and Sharifi (2016), specific emphasis is placed on the importance of tourism, the role of farming, community wealth and income, and how well infrastructure and services are developed.

The economic domain in Vent is characterized by substantial shifts in the main economic pathways over the past 200 years. Like many Alpine communities before the advent of mass tourism in the 1960s, Vent was a poor village with income based almost entirely on agriculture. There was some mountain tourism in the village in the 19th century centred on mountain huts established and managed by locals

(with British mountaineers predominating), but tourist numbers were small (e.g. in 1856 16 tourist nights recorded) and only limited tourist accommodation was available in the village before World War 1. The attraction of Vent as a tourist destination increased substantially after 1931 (ca 15,000 tourist nights recorded in 1928) when the village became briefly famous after the emergency landing of Auguste Piccard with his stratospheric balloon (e.g. in 1932 already 30,000 tourist nights were recorded), but World War 2 temporarily stifled any further tourism development (Scharr, 2013).

A key transitional rupture occurred in the 1950s when the current tourism pathway for Vent was established. While the adjacent communities of Obergurgl and Sölden opted for mass skiing tourism based on decisions taken by stakeholders associated with powerful landowning families who sought business for their newly established hotels, Vent opted for an early form of 'ecotourism' as a 'Bergsteigerdorf' (village for hiking/climbing tourism) focused on guided ascents of the Wildspitze (at 3770 m the highest summit in North Tyrol). Although the decision not to opt for mass skiing was partly influenced by high avalanche risk in large parts of the valley, shallower upper slopes could have been substantially developed (Resp 31, regional tourist manager). This decision enabled a 'softer', less intrusive, form of tourism to develop and, as a result, today Vent only has four small ski lifts. The result has been that today summer and winter use of beds is broadly even (ca 70,000 nights/year each), while seasonal tourism is much more skewed towards the winter season in both Obergurgl and Sölden.

The decision in the 1950s *not* to opt for mass skiing tourism is seen by many contemporary stakeholders as a mistake. The regional tourism office representative (Resp 2), for example, argued that

> "Due to the fact that Venters were very self-sufficient in the past, they still are well known for their stubbornness and 'their own way of doing things'. This has meant that any decision perceived to come from 'outside' is seen as potentially threatening, and if the villagers are not approached in the right way … this has often led to rejection of what many have though were positive suggestions for the development of Vent. The decision not to adopt mass ski tourism is one example, where a few key decision-makers in the 1950s decided not to copy what Obergurgl and Sölden were doing."

Indeed, most respondents agreed that, in hindsight, this transitional rupture may have been a mistake and that Vent has slightly fallen behind economically compared to similar high Alpine localities. Many argued that Vent is now 'neither here nor there' and that its identity as a tourist destination is not sufficiently clear (e.g. Resp 18, 22, 25).

Several respondents argued that poor economic decision-making pathways were exacerbated by the failure in 1991 to grasp opportunities associated with the discovery of 'Ötzi', the famous 6000 year old 'iceman' (discovered only 7 km from Vent near the Italian border). While several key stakeholders (e.g. Resp 4, local historian and cultural critic) suggested that Vent should have incorporated tourism opportunities associated with Ötzi in the already established UNESCO Biosphere reserve (an outcome of 1980s MAB Project; see above), Vent residents "did not understand the concept and did not want it due to a lack of understanding of the wider repercussions … They did not want to dilute their narrow focus on Vent as a mountaineering destination" (Resp 4, local historian). As a result, some key decision-makers have become frustrated and 'given up' with Venters and see this as a missed opportunity (e.g. Resp 4,5,46). However, the regional tourism representative (Resp 2) argued that decision-makers at the time of the Ötzi find thought it was "unethical to make money from a corpse", and that the planned Ötzi information centre would have caused substantial problems associated with car traffic and parking. Others emphasized that the decision to opt against the centre highlighted the fact that "Venters don't want to be told by others [e.g. tourist office] what to do. But in hindsight this was [another] mistake as the village of Umhausen [20 km down the valley from Vent] now has 'Ötzidorf' which is proving a huge success with tourists" (Respondent 29, academic). In acknowledgement of the past reluctance of Venters to opt for more 'radical' tourism development, Ötztal Tourismus, the main decision-making body for tourism development in the valley, has embarked on a relatively unambitious new framework for tourism in Vent (2015–2025) with a strong focus on maintaining the status quo (Ötztal Tourismus, 2015).

Despite of what many see as missed opportunities for innovative tourism development, Vent is nonetheless (like most Austrian communities) a relatively wealthy village linked largely to tourism income. Although the village has been affected by the post-2008 recession (especially through a reduction of Russian and British tourists and increase in youth unemployment; see also below), in 2016 Vent recorded ca 140,000 tourist nights split over only 140 inhabitants, which means a good income at least for those who have survived the vicissitudes of modernization and globalization (see below). As a result, Vent's GDP/capita is ca €35,000, slightly lower than Obergurgl and Sölden with ca €40,000/person (Statistik Austria, 2016). However, interviews revealed that wealth is unequally distributed, with hotel owners generally perceiving themselves as relatively wealthy (hotels often owned and managed by families), while the remaining six farm families saw themselves as relatively poor (there were ca 25 farms in the village in the mid-19th century). To generate additional income all Vent farmers are part-timers and offer tourist accommodation (pluriactivity). Interviews revealed that these farmers still see themselves as 'farmers' (identity), but all respondents agreed that the main income today comes from tourism (Resp 1,15,16,17,19,37). As a result, Alpine farming in Austria is heavily subsidised (e.g. ÖPUL agri-environmental scheme) without which Vent farmers would not be able to survive. One elderly farmer (Resp 1), with some limited tourist accommodation, thus, acknowledged that "we know that we are poorer than many of our neighbours, but we are proud to be farmers and chose [in the past] not to replace our farm with a massive hotel". Many commented particularly positively on the close interlinkage between agricultural production in the village (especially meat and dairy products) and hotel restaurants, as all Vent hotels with farm links (about 45% of all hotels) source their food locally, thereby reducing carbon footprint, guaranteeing a market to local farmers for high quality local products, and ensuring at least some regular income to local farmers. This embeddedness of hotels in local agro-commodity chains appears to be relatively unique in the Alps (Zucca, 2006) and has important repercussions for community resilience (see below).

What repercussions do these economic pathways have for the resilience of Vent? Above analysis shows that a mixed resilience picture emerges with regard to the economic domain. While Vent is a wealthy village, it is locked into pathways of high tourism dependency which have also increased economic inequality between villagers (especially between hotel owners and farmers). In resilience terms the key decision in the 1950s *not* to opt for mass skiing tourism has been twofold: on the one hand it has prevented the community from accumulating equal amounts of wealth compared to the two neighbouring communities of Obergurgl and Sölden which have higher per capita GDP; on the other hand this decision can also be interpreted as positive for resilience as the community is less dependent on skiing tourism − a potentially crucial factor in view of increasing negative impacts of climate change (see discussion on natural domain below). Vent is, nonetheless, still locked into increasingly unsustainable skiing pathways, exemplified during the very dry and snowless December of 2015 when skiing operators were desperately carting artificially produced snow by truck from one end of the village (near the river where water was available for snow cannons to produce snow) to the other where the beginners' skiing slopes were located (high vulnerability). Most agreed that a negative decision was taken in the 1990s when opportunities to benefit from the nearby Ötzi find were not realized, arguably creating negative lock-ins associated with decisions linked to socio-historical attributes of the community (see above) which may have stifled economic development and increased economic vulnerability. However, above analysis

also highlighted that the close interlinkages between agricultural production in the village and food offered in hotel restaurants should be seen as a trait of strong resilience. Overall, therefore, the sum total of variables within Vent's economic domain suggests that it is ***moderately resilient in economic terms***.

3.2. The social domain

This section analyses social variables and how these are affecting the resilience of Vent. Building on critical resilience studies such as Kelly et al. (2015) and Wilson et al. (2016), specific emphasis is placed on outmigration of young people, stakeholder interactions, the ability of community members to rely on neighbours at times of crisis, communication between stakeholder groups, and residents' control over development trajectories.

One of the key issues facing Vent is outmigration by young people. In this context, Vent shares the fate of many remote rural communities (Wilson et al., 2017) as outmigration has been a feature of remote Alpine communities such as Vent since the 19th century (Scharr, 2001) when urbanization and the spread of industrialization began to offer outside opportunities for young people. Outmigration has particularly affected farm families, exacerbated in Vent through the successionary custom of primogeniture (passing on of farm to oldest son), which meant that only the oldest son could start a new family. In recent decades about one quarter of young people aged 20–35 have left Vent (Statistik Austria, 2016), although the rise of tourism, especially since the 1980s, has led to a slowing of outmigration due to improving employment opportunities for young people (Resp 26,42,49). A regional official (Resp 20) argued that "the biggest issue for our communities is that young people are moving away. Skiing is providing some job opportunities, but not enough to keep our young people in their villages. Many have moved to Innsbruck and beyond", while a tourist business owner (Resp 18) lamented that "I tried to provide enough incentives for my two children to stay here and work in the village, but they have both moved away. One has gone to Germany, the other to Switzerland". Similarly, a farmer (Resp 15) complained that "I would like my son to take over the farm, but he has never shown much interest as incomes are too low in farming … He has now moved away and I have nobody to pass on my knowledge how to farm this fragile landscape", while a camping owner (Resp 3) suggested that "even tourism businesses have few successors, and people from outside the valley increasingly are taking over, for example skiing instructors from Holland (laughs!). Also many young families prefer to stay closer to services such as schools further down the valley". Outmigration of young people from farms also has complex impacts on the landscape. On the one hand reduced farming intensity means more woody encroachment which has improved avalanche protection, but on the other hand woody encroachment is negative with regard to landscape aesthetics (tourist preferences for 'open' high altitude landscapes) and skiing. However, researchers have to be careful not to fall into the trap of labelling outmigration as only negative for community resilience. Indeed, young people have always left communities in search of better opportunities (education, employment, etc.) and several respondents suggested that retaining young people can also mean an increased chance of lock-in and 'backwardness'.

Stakeholder interaction, the ability to rely on neighbours at times of crisis, and communication between stakeholder groups within the community, have also seen substantial changes over the past decades. As with many tight-knit communities, historical evidence for Vent suggests that stakeholder interaction had to be strong in the past (Scharr, 2013; Resp 4). Interestingly, due to the lack of a road connection with the rest of the Ötztal until 1948 key linkages of Vent were over mountain passes with the south (Schnalstal and Vintschgau in South Tirol, today in Italy) rather than with the rest of the Ötztal, although this was severely affected by the growth of glaciers and worsening winters during the 'Little Ice Age' 1650–1850 (Meleghy et al., 1982). It is thought that Vent was settled from the south, which has led to pronounced cultural differences that are still evident today between the 'back of the valley' (including Vent) and lower parts of the valley (Haid, 1992, 2008). Severe winters, avalanches, and no road access meant that the community was often completely reliant on its own resources. One elderly farmer (Resp 1) reminisced that "even when I was young (1930s/1940s) the village was at times completely cut off from the world. We just had to rely on each other for survival. If one [farm] family did not have enough provisions or was lacking this or that neighbours would always help, in turn expecting to be helped if they ran into trouble". Before road access in 1948, this respondent's farm was, for example, self-sufficient in milk, meat products and mountain cheese – a sign of strong resilience out of necessity. As a result, several respondents argued that, in the past, communication between families and individuals was good and effective, and village life was characterized by frequent formal and informal meetings/events at which key information could be exchanged (church, local primary school, meetings between farmers' families).

This situation changed with the rapid rise of tourism since the 1960s. Farmland was sold or converted for tourism (hotels, ski runs) and today 90% of buildings in Vent are linked to tourism (hotels, a few ski or hiking shops). This transition from a farming- to a tourism-dominated community has led to absenteeism: between May to June and October to mid-December many hotel owners leave the village as they often have 2nd homes/flats nearer Innsbruck or go away on holidays (Respondents 2,4). Observations in the village in November and early December confirmed that the village was 'dead' in the off-season with associated lack of services. Many respondents mentioned that absenteeism has severely disrupted stakeholder interaction and has also reduced communication between stakeholders – a process also exacerbated through increased competition between hotels as owners are playing 'their cards closer to their chests' (e.g. Resp 1,4,6,23,24,40). An elderly farmer (Resp 1) lamented that "when the tourism boom started in the 1950s all families were about the same [strong social capital]. But things changed when some families started developing large hotels and became wealthier than others [e.g. family 'clans'; divergent community pathways] … Tensions arose within the community: there was envy, our children suddenly got bullied at school". Many respondents agreed that this led to the emergence of a two-tier community with less cohesion than in the past, leading some key figures in the community (e.g. cultural critic Resp 4) to heavily criticize how tourism has negatively affected social capital in Vent. This has been exacerbated through the changing role of the church which gradually lost power as a key stakeholder during the 20th century and has further contributed to the disintegration of formerly strong networks. Respondent 2 (tourism office representative), therefore, argued that "the cohesion of the village has changed dramatically in the past decades… While in the past everybody was willing to help each other, today there is much more of a feeling of selfishness and profit-maximisation. People don't talk to each other so often any more, everybody seems to be out to make the most for themselves. It is sad really". This was further supported by Scharr's (2013, 71) recent study of Vent which argued that social change "has led to dramatic changes in day-to-day routines and brought tensions between the generations".

The individualisation of decision-making among village stakeholders, thus, has impacted on communal decision-making opportunities, as many decisions (e.g. about land management) are no longer taken communally. These problems are likely to be exacerbated in future as outsiders (Czechs, Russians) are now beginning to buy up Vent hotels which further changes community dynamics and cohesion in an already fragmented community. It is nonetheless important to highlight that in the age of increased mobility communities are less static than in the past, and in the case of Vent even 'local' residents move out (most at least for certain times of the year) and new people move in and become permanent or temporary members of the community. Many respondents commented on whether these newcomers become accepted

or not (e.g. often they remain outsiders because they don't speak the dialect; see below), but overall newcomers were seen to have some positive impacts on community resilience as they bring new ideas, knowledge, investment (e.g. as hotel owners) or network connections that can help stimulate new or diversified development pathways. In many ways this mobility and increased multi-dimensionality of what makes up the 'local' community helps with adaptive capacity and the transformability of the community (see also Kelly et al., 2015, for remote Italian communities). Despite of their remoteness communities like Vent, thus, are not static and homogenous entities, and conserving the status may, therefore, not optimise resilience processes.

The community's perceived ownership and control of development trajectories and relative levels of happiness have been equally affected by these social changes. In this sense, the Ötztal may epitomise the complex interweaving of pre- and post-modern decision making processes where some segments of society 'stick to the old ways' of doing things (e.g. family clans), but at same time some stakeholders (especially tourist and hotel businesses) have become highly globalised and interconnected. As a result, stakeholder perceptions of their community are relatively sceptical. While the wealthy hotel owners (three large 'clans') expressed great satisfaction with how the community has developed (e.g. Resp 21,22,23), others were negative, with farmers particularly bemoaning the continuing marginalisation of farming (although mentioning the positive links with hotel restaurants; see above). Thus, an elderly resident (Resp 6) complained that "since large-scale tourism started in the 1960s the community has grown further and further apart", while a hotel owner (Resp 24) confessed that "I think the wealth of some people in the village is causing more harm than good … the community is no longer as cohesive as it was in the past", and an elderly resident (Resp 7) in response to a question about happiness in the community argued that

> "Happiness? I am not sure you could say that people are happy in Vent … Some are happy because they made a lot of money … but look at the place [looks at view out of window which shows a deserted road and closed hotels during off-season]! Does this look like a happy place? I mean … yes… people still can trust each other and we stick together when there is a problem, but on the whole …no…I wouldn't say that this is a happy village any more".

Nonetheless, many mentioned that the role of women has changed positively with the advent of tourism as women today have more power, control and stake over their tourism businesses as more educated roles are needed compared to their farming roles in the past (Resp 23,25,42).

Service-related indicators are particularly problematic. Infrastructure, for example, continues to be relatively poor in Vent. The village had its first road access as late as 1948 but the road was only passable with 4-wheel drive until the 1960s. Before part-tunnelling of vulnerable road sections in the 1980s and 1990s, the village was often cut off by avalanches, and the bus connection continues to be very poor for Austrian standards (only two buses/day) meaning that village residents are dependent on cars. Service provision (shops, doctor, school, etc) is even worse with no shop or restaurant in the village off-season, no doctor, no school (closure of primary school in 1990s; nearest school 20 km away), and no local priest (local church closed in the 1990s). This vicious circle of gradually worsening service provision is the key reason why the village is virtually 'dead' in the off-season from May-June and October-mid December. An elderly resident (Resp 35) expressed his frustration with the lack of services: "Everybody here will tell you that the services are a nightmare in Vent. If you are old or disabled it is difficult to get out of the village if you can't drive anymore, but to be fair neighbours are always here to help".

Social change has, thus, undoubtedly had severe repercussions for the resilience of Vent. Overall, social factors provide a complex picture dominated by the fact that both bonding and bridging capital have deteriorated on the back of rising income inequality, high seasonality (people moving away during off-season), and outmigration of many young people (see also Stump, 2010; Wilson et al., 2017). Outmigration has been particularly negative for resilience as it has affected family business continuity (farms, but also tourist businesses), and has also disrupted social memory as the passing on of traditional skills to the next generation (e.g. sustainably farming fragile ecosystems) has been severely impeded. As Meleghy et al. (1980) already highlighted, economic expansion in Vent has occurred at the expense of private networks and has resulted in weakening community solidarity. As a result, community resilience has been weakened as the ability of the community to act as a cohesive unit has been degraded, increased selfishness means that neighbours may no longer be willing to help each other at times of crisis (indeed, the failure of adjacent tourism businesses can be seen as a potential advantage for some due to reduced competition or the opportunity to enlarge one's own business; Resp 1,49,51), and communication between stakeholder groups has diminished particularly due to seasonal absenteeism and the associated inability of many to attend village meetings in person. Overall, therefore, the sum total of variables within Vent's social domain suggests that it is ***moderately resilient in social terms***.

3.3. The cultural domain

Cultural factors are important indicators of how well social memory is developed in a community and provide essential information of the importance and pride attributed by locals to traditional and customary beliefs and processes (Stump, 2010; Wilson, 2015). Understanding community rites and traditions is particularly important, especially as cultural factors shed important light on positive and negative lock-ins as well as path dependencies that may stifle or enhance community resilience. Overall, the picture for Vent appears to be more positive as there is strong evidence that, despite moderate economic and social resilience, cultural factors show high levels of resilience.

Traditions and rites in both Vent and the Ötztal valley are closely intertwined with farming and landscape management. Mesolithic settlement began in the valley ca 7500BC and C_{14} dates suggest forest clearance began near Vent around 4500BC (Scharr, 2013). There is, thus, an abundance of archaeological evidence related to farming and human interaction with the environment in and near Vent, and associated traditions and social memory have been carried by just a few hundred inhabitants over several generations (Haid, 1992). This provides historians with a fairly unique record comparable only to other long-settled remote mountain valleys in places such as South America, Papua New Guinea, and a few other remote valleys in the Alps (Zucca, 2006).

A key traditional cultural 'lock-in' is the fact that Venter adopted the Christian religion in the 6th century AD, with the village being 100% Catholic until the most recent past. Several respondents argued that this has enhanced strong community cohesion in the past (Resp 26,44,48). Catholicism continues to play an important role in the spiritual worldview of local residents and crucifixes are, for example, seen as an important tool to ward off evil spirits and to protect the village from avalanches. Respondent 1, an elderly farmer, emphasised that "I pray every winter to the Virgin Mary to protect us from avalanches and from catastrophes such as landslides". However, the fact that the local church closed in the 1990s was seen by many respondents as a factor that has reduced their ability to meet and discuss spiritual and religious matters (e.g. Resp 16,27,39).

Animals and livestock management emerge as a key part of Venter traditions and rites. A key example of the importance of tradition relates particularly to *transhumance*, i.e. the movement of sheep over mountain passes to Italy and back reinforcing the above-mentioned traditional links of Vent to the south rather than to the Ötztal itself. Documentary evidence shows that in AD1415 the boundary of land use rights by farmers from the southern (today Italian) Schnalstal was demarcated on maps, and even today ca 2100 ha of grazing land above

Vent can still be legally used by Schnalstal communities for transhumant practices. Thus, although less important than in the past, transhumance still plays an important part in the yearly farming cycle (and has become a major tourist event) as does the use of high mountain meadows (Almen) used over summer for grazing. In 1940 ca 4000 sheep were driven over the mountain passes in summer, while by 2016 that number had dwindled to 2000 (Haid, 1992), yet transhumance remains an important enough part of Vent's cultural heritage that is has been incorporated as a key feature of the UNESCO Biosphere Reserve's focus on 'intangible cultural inheritance' (Haid, 2008). Nonetheless, high alpine meadows are today used less frequently (and only by sheep and no longer cattle) although an interesting 'transposition' of tradition from agriculture to skiing could be observed: the author witnessed the opening of the winter season in Vent (around mid-December) which today mimics festivities associated with the traditional moving of livestock from the valley to summer meadows (Almauftrieb), emphasising changing economic pathways highlighted above.

A relatively recent tradition emerged in Vent in the 1870s with the specialist breeding of 'Haflinger' horses which began with one Arabian half blood from Italy and the transformation of these horses from a working animal to an 'elegant leisure animal' bred today in over 40 countries. Interestingly, the Ötztal, and Vent in particular, emerge today as a centre for Haflinger breeding, and several respondents highlighted that Venter and Ötztal farmers have been instrumental in organising Haflinger breeding into one world organisation which includes national organisations such as the Haflinger Society of Great Britain (see www.haflingersgb.com). The pride respondents felt when talking about Haflinger breeding in Vent is epitomised in the following by Respondent 37 (a farmer): "Well…we have bred Haflinger horses now for three generations in my family and it is a very important aspect of our cultural heritage [Kulturerbe]. Both my children will continue it as they have learned all the skills associated with the breeding of such beautiful animals".

A particularly insightful aspect of the importance of cultural factors for assessing the resilience of Vent came from respondents' comments about language and local dialect evolution as a key aspect of village tradition. The local German dialect that predominates in the valley (Ötztalerisch) is a key sign of resilience, supported by the UNESCO that acknowledges that in times of globalisation the survival of local dialects is key for helping to maintain regional traditions and local knowledge. As a result, the Ötztaler dialect is now officially recognised in Vent and the Ötztal as part of UNESCO's intangible cultural inheritance, especially as Ötztalerisch is possibly the oldest dialect in Austria with roots in the 13th century. Linguistic research suggests that the oldest dialects tend to survive in the highest and remotest communities (such as Vent) and that dialectical differences between the upper and lower Ötztal are still evident. Thus, while not much visible cultural heritage (e.g. original architecture) is left in villages such as Vent due to the building of new hotels since the 1960s and the near complete disappearance of old buildings, tradition through language continues to be very important. Most importantly, several respondents argued that maintenance of the local dialect has led to a recent 'identity push' as the dialect is perceived to be very important in the community (Resp 4,7,41). Indeed, linguistic experts were 'surprised' that the local dialect has survived in the upper Ötztal (e.g. Haid, 1992), suggesting that the dialect shows clear signs of survival of community networks as well as pride in the locality − all key cultural attributes for strong resilience. This is particularly important considering that the local dialect becomes a 'minority language' during the tourist season, and the ability to speak (and understand) the local dialect, therefore, strengthens feeling of belonging to the local community (Resp 1,5,20,23). This shows that, in contrast to local music or traditions in Vent, the local dialect is the *only* cultural practice which has not been changed by tourism and acts as a 'code' for locals which allows communication only between locals. The dialect, thus, represents a core community value that helps build identity and underpins local knowledge systems which define 'belonging' and 'outsiders'.

Despite positive resilience processes associated with language and dialect, the outmigration of young people from Vent over the past decades has severely weakened cultural attributes of the community, especially as traditional skills and knowledge can no longer be successfully passed on to the next generation (Resp 4,26). This is particularly true with regard to the passing on of skills, traditions and practices related to agriculture (Resp 1,15) but also affects other aspects related to culture such as traditions associated with religious rites, social memory and societal conventions (e.g. linked to family and community values) (Resp 6,43,51). Nonetheless, the importance of valuing and enhancing rites, traditions and social memory in the valley has been recognised through the establishment in 2013 of the 'Ötztal Gedächtnisspeicher' (memory bank), a building that houses artefacts and information linked to the memory of the valley and which is a place for locals and visitors to meet and talk about the past (Resp 4). Specific emphasis is placed on showing evidence of special skills, rites and traditions that were important in the past but that are still alive today − for example through pictures and information about activities such as Haflinger horse breeding or traditional oven building − but the centre that also acts as an important place for young people to remember skills of their forbears.

Overall, therefore, the picture with regard to the cultural domain, especially traditions, rites and cultural inheritance, is more positive for the resilience of Vent than the economic and social domains. Despite diminishing social and economic resilience, rites and traditions continue to be important and are expressed both through traditional animal and landscape management (e.g. transhumance, skills associated with the breeding of Haflinger horses), through survival of the local dialect and its associated 'identity 'push', and through pride in the locality with its rites and customs that are also seen as key factors that attract tourists. However, critical local voices also advocate that a revitalisation of traditional skills is urgently needed, especially in the face of continued outmigration of young people, and that a changing value system from pre-capitalist (religion, fear of mountains) to capitalist values (profit-maximisation, greed) has led to an over-emphasis of economic gain exemplified by selfishness and a commodification of nature. Nonetheless, the sum total of variables within Vent's cultural domain suggests that it is (still) ***strongly resilient in cultural terms***.

3.4. The political/governance domain

As highlighted in the critical resilience literature, the political domain is often difficult to investigate methodologically due to issues of respondent positionality (respondents often do not want to reveal their political positions) and a reluctance to talk about notions of power and politics affecting immediate friends and neighbours (Emery and Flora, 2006; Brassett et al., 2013). Similar issues were evident during interviews in Vent, as most respondents felt uneasy talking about political shortcomings of people they knew and, at times, were dependent on for jobs or financial security. Nonetheless, sufficient information could be collected from the 51 interviewees to paint a broad picture of political and governance[2] factors affecting the resilience of the community.

Interviews highlighted that although respondents felt that Austria is a well working democracy, governance structures are relatively poorly developed in Vent. Three key problems were mentioned repeatedly during interviews: the underrepresentation of Vent in regional governance structures, the fact that political and economic power is concentrated in the hands of a few family 'clans', and the resulting

[2] Governance is understood here as the act or process of governing from micro- to macroscale, the involvement of a range of institutions and actors in the production of policy outcomes through complex interaction between state and non-state actors (Rhodes, 1997; Jessop, 1997). A key focus here will be on representation of Vent stakeholders in local-decision making structures and how locals as owners of the land in and around Vent can implement resilience strategies in light of possible constraints from outside the community blocking their options.

opaqueness of decision-making structures which excludes many stakeholders.

The underrepresentation of Vent in regional governance is closely connected with economic decisions taken in the 1950s/1960s *not* to opt for mass tourism, a transitional rupture that has defined community pathways and opportunities ever since (see above). In political terms, many respondents argued that this decision marginalised Vent due to resulting smaller tourist numbers and income compared to other communities such as Sölden and Obergurgl. The associated small population increase (to only 140 inhabitants today) meant that Vent politically lost 'clout' within the Ötztal as a whole (Resp 4,20). As a result, only few Venters have been members of the municipal council over time and there was a general feeling that decisions were/are often imposed on the village from 'outside' − a top-down decision-making process where locals often feel disenfranchised and that, arguably, has reduced resilience of the community (Resp 20,46,49). One hotel owner (Resp 25), for example, argued that "the under-representation of our village is a continuing problem … I have tried several times to be elected to the municipal council and to influence decisions but with no success". Cultural factors, especially the historical orientation of the village towards the south (see above), have also reinforced the political marginalization of Vent as villagers have been reluctant to engage with the wider Ötztal valley, leading the mayor of one of the Ötztal communities (Resp 20) to suggest that "people in Vent are a bit phlegmatic and reluctant to engage a bit more with us here in the valley".

The fact that economic and political power is in the hands of a few family clans was also repeatedly mentioned as contributing towards weak political resilience. Some families (both from Vent and from other communities in the upper Ötztal) became very wealthy and influential on the back of the post-1950 tourism boom, resulting in disproportionate influence on decision-making structures (Resp 14,24,41). This has led to development decisions which appear to favour 'big business' at the expense of small tourism businesses and farms. One hotel worker (Resp 8) argued, for example, that "the big family clans in Vent and Obergurgl [close hotel ownership links] define what is good or bad for our village … but it's not democratic. Sometimes their decisions are good for all, but often they are bad". This concentration of power in the hands of a few was already recognized in the 1980s MAB project where poorer stakeholders in Vent were described as still hoping to gain more income from tourism at the time, but even then powerful family clans prevented others from gaining a larger foothold in tourism and may have influenced key decisions in the 1960s not to opt for mass skiing tourism (Meleghy et al., 1980, 1982). The result has been an opaqueness of decision-making structures which excludes many stakeholders and the often uttered complaint that "key decisions are taken by large family clans behind closed doors!" (often in neighbouring communities rather than in Vent itself) *before* official meetings of the municipal council (Resp 5), and the fact that competition between communities has increased resulting in less regional coherence.

The implications of these political processes for the resilience of Vent are obvious: Vent is currently in a weak position to take control over its own development trajectories, and at times of shocks/disturbances the community has to rely largely on external institutions for help, all resulting in self-reinforcing cycles of political weakness that are also partly responsible for outmigration of young people. The sum total of variables, thus, suggests that Vent is ***weakly resilient in political/governance terms*** (i.e. highly vulnerable).

3.5. Natural factors

The natural domain, which includes factors such as water availability and quality, soil management and, most importantly, climate change processes, is one of the most important for explaining the resilience/vulnerability of Vent. Climate change is emerging as a very important issue, especially as there is clear evidence that the climate is changing through processes such as rapidly shrinking glaciers and rising temperatures. Glaciers have never been very 'substantial' in the Ötztal mountains (i.e. often < 200 m ice thickness), especially when compared with many Swiss or French glaciers, due to the relatively lower elevation of the mountains in Austria (Wildspitze in Ötztal at 'only' 3770m) (Fuchs, 2009; Luthe et al., 2012; Koch and Erschbamer, 2013). Despite clear evidence of declining snow cover over the past 20–30 years and especially an increasingly delayed onset of winter snowfalls, lock-ins and path dependencies are evident with continuing emphasis on skiing, albeit with less intensity in Vent than in Obergurgl and Sölden. To make up for the lack of snow in the upper Ötztal, snow cannons in the valley use 20–40 million m^3 of water every year, and this commentator observed the daily (!) routine in Vent (over Christmas 2015/16) of a lorry transporting artificial snow made near the river to a children's skiing area ca 1 km away (see above). Interviews revealed that most stakeholders cannot conceptualise development pathways that do *not* involve skiing, and that many were in denial that climate change was happening (e.g. Resp 6,18,20,39).

A local commentator observed that climate change perceptions in communities such as Vent have been shaped by long-term processes of social memory, and that identity and knowledge have been particularly strongly shaped by glacier retreats and advances (Resp 4). Thus, climate change associated with the 'little ice age' (until ca 1850) is still strongly embedded in Ötztal social memory, and historical information continues to be passed on through the generations about how quickly glaciers used to re-advance in the past. As a result, many villagers are still sceptical about global warming and see the current (rapid) retreating of glaciers as just one of many cycles that occurred over the past 200 years. The notion of social memory shaped by historical glacier movement is, thus, deeply engrained in villagers' consciousness.

Nonetheless, for many elderly respondents in particular the signs of climate change are unmistakable and many respondents referred to the rapidly thawing permafrost in upper altitudes leading to land- and mudslides, the appearance of new insects and bird species in high altitudes (e.g. woodpeckers), as well as large-scale rock falls (linked to thawing) and high water levels in valley streams that are increasingly threatening the safety of summer visitors (Resp 1,2,5,6,12,35,42). A local hunter commented that "it is so warm in autumn these days [November] that the chamois are nowhere to be seen in low altitude" and suggested that climate change is beginning to change traditional hunting practices (Resp 9). As observed by this researcher, both the incidence of rock falls and local river floods were exacerbated by consecutive summer heat waves in both 2015 and 2016. Engrained in the locals' memory, in particular, is the so-called 'Ötztal disaster' from 1987 where large floods destroyed the access road and cut Vent off for several weeks (Resp 1,4). Nonetheless, a warming climate has also led to changes in the traditional 'Almabtrieb' (moving of livestock from high altitude pastures to the valley before winter) which, according to several famers, occurs later and later every decade and can be interpreted as positive for the resilience of the farming community (Resp 15,16,17,19,37).

Climate change is beginning to severely affect water management in the valley. Winters are getting drier in an area that is already relatively dry: on average Vent only receives ca 700 mm of rain/year, but the severe drought in November/December 2015 meant that for the first time in human memory forest fires were threatening communities in the upper Ötztal. Most importantly, the rapid shrinking of glaciers above Vent and the high water levels in local streams (due to excessive glacier melting) are beginning to cause problems for local hydro-electricity installations (Resp 32,33). Vent has had a small electricity station generating energy from the local stream since 1911, but the last 10–15 years have, for the first time, seen severe disruptions due to either insufficient or excessive water levels in the local stream. The increasing need for water for snow cannons especially during dry winters is further exacerbating issues of seasonal water shortage (Resp 32).

The implications of climate change for the resilience of Vent are serious and are leading to increased community vulnerability. Changes

in snowfall and temperatures with associated lack of snow, rock falls, and water management issues are threatening both summer and winter tourism. The situation is exacerbated by economic and psychological lock-ins and path dependencies that still see skiing as a key focus for Vent's tourism strategy (Resp 2), worsened further by a lack of local political power and a will to change pathways (as mentioned above). However, the situation in Vent may be less severe in resilience terms than in the neighbouring communities of Obergurgl and Sölden with their monofunctional focus on skiing. Vent's *multifunctional* strategy of summer and winter tourism, as well as its strong links between tourism and agriculture (see above), all provide a relative buffer to climate change impacts and are spreading the risk more evenly across various stakeholder groups (i.e. those focusing on either winter or summer tourism as well as farmers). There is also evidence that lock-ins related to the natural domain may begin to be challenged by certain stakeholder groups, especially as some are suggesting changes to winter tourism away from a dependency on downhill skiing towards more flexible cross-country skiing, sledging, mountain biking, or even heating snow cannon ponds for swimming (Resp 2)! Nonetheless, the sum total of variables, and the predominance of negative processes, suggests that Vent is ***weakly resilient in terms of the natural domain*** (i.e. highly vulnerable).

4. Discussion and conclusions

Building on critical community resilience studies (Davidson, 2010; Wilson, 2015; Anderson, 2015), this study set out to analyse the resilience of the village of Vent, a remote mountain community in the Austrian Ötztal valley challenged by slow-onset disturbances such as climate change, outmigration of young people and the repercussions of the post-2008 recession. A conceptual framework based on Emery and Flora (2006) and Kelly et al. (2015), that focuses on how well economic, social, cultural, political and natural domains are developed within a community (see Fig. 1 above), was used as the conceptual springboard to assess the resilience of Vent. The study has highlighted that Vent is facing huge resilience challenges. Fig. 3 highlights that Vent is particularly vulnerable (weak resilience) with regard to the political and natural domains, is only moderately resilient in economic and social terms, and that only the cultural domain emerges as strongly resilient. Assuming that these five domains are equally important for the resilience of Vent (see Kelly et al., 2015, and Wilson et al., 2016, for critical discussions), this suggests that, overall, Vent is, at most, moderately resilient in the face of continuing and future shocks/disturbances.

This study contributes to the wider literature on community in six key ways. First, it suggests that an approach based on the five resilience domains provides a richly textured framework for understanding the subtleties of resilience pathways and transitions. Yet, the fact that nearly one third of residents were interviewed has helped obtain a relatively 'full' picture of complex resilience processes which would not be possible in a much larger community/town or city (Bene et al., 2015; Cutter et al., 2016; Allen et al., 2016). Obtaining a relatively complete picture of resilience is, inevitably, easier in small (and geographically bounded) communities.

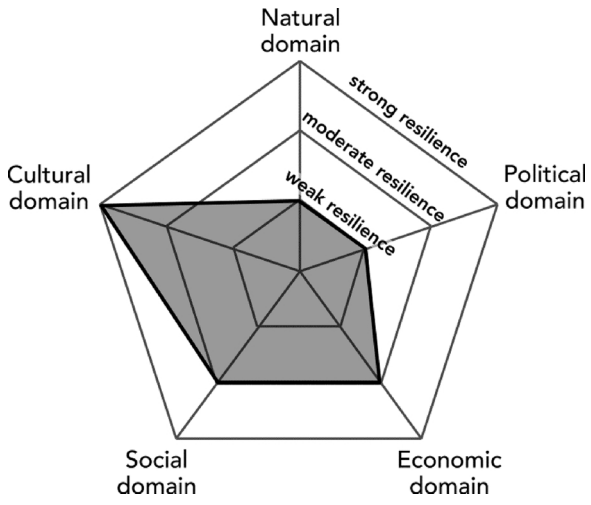

Fig. 3. Community resilience in Vent based on cultural, economic, social, political and natural domains (Source: authors).

Second, the study particularly shows that the relative 'balance' between the five domains (Kelly et al., 2015) is currently precarious and may become more precarious due to several self-reinforcing cycles. Climate change is affecting tourism, but the fact that the village has continued to place considerable emphasis on skiing is in itself a vulnerability factor (i.e. lowers adaptability and transformability of the community). Nonetheless, compared to other tourism centres, the presence of a high proportion of summer tourism is positive for adapting to future climate change, and once the glaciers disappear altogether (possibly by end of 21st century) Vent will be in a more advantageous position than neighbouring communities that have continued to focus entirely on skiing (i.e. Vent will be able to conserve at least some existing functions and structures [persistence]).

Third, outmigration by young people emerges as both a response to, as well as a cause for, reduced community resilience in Vent, echoing recent critical studies that have highlighted the complex interlinkages between youth outmigration and community resilience (e.g. Wilson et al., 2016, 2017). However, the issue of outmigration can be partly addressed by incentives that enable the filling of the void with new migrants, return migrants (i.e. attracting youth back in later years) or temporary migrants who should be encouraged to integrate locally without upsetting embedded economic, social, cultural and political domains too much.

Fourth, negative path dependencies and lock-ins emerge as particularly problematic, evident not only through the perseverance with skiing pathways, but also through a lack of incentives and policies to prevent youth outmigration and a historically-engendered lack of political integration with the rest of valley which are, in turn, affecting adaptability and transformability of the community. Nonetheless, the cultural embeddedness of the community through rites, traditions and particularly the local dialect is still very strong, showing clear potential for the maintenance of strongly resilient pathways – processes further strengthened by innovations such as the Ötztal museum of social memory.

Fifth, any study of community resilience needs to acknowledge that interpretations of the 'strength' of individual resilience components at community level need to be treated with caution (Wilson, 2012; Levine, 2014). As Emery and Flora (2006) emphasised, conceptualising resilience based on various domains may inevitably lead to a drift towards *moderate* resilience, which also appears to be the case in this study. However, in villages such as Vent this outcome is probably a relatively accurate reflection of current resilience and vulnerability processes, as the discussion above has highlighted that communities such as Vent inevitably have some components or domains that are better developed (i.e. more resilient) than others, and similarly some stakeholder groups (e.g. hotel owners, to some extent farmers) appear to be more resilient than others. Echoing critical studies by Davidson (2010) and Wilson (2012), community resilience is, thus, often akin to a zero-sum-gain where individual components may at times weaken or strengthen resilience pathways but where community survival is based on a reasonably well developed 'balance' between the majority of components. Indeed, this study suggests that very few communities have well developed domains across the board, especially if longer timescales are considered, in other words, there is always vulnerability in the system somewhere (see also Kelly et al., 2015). On the other hand, much research has shown that although it may be difficult to find communities with strongly resilient characteristics across all five domains for an

extended time period (Wilson, 2012), there are many examples of vulnerable communities with very weak resilience attributes (i.e. communities that have not been able to rebuild themselves after slow or fast-onset catastrophes; e.g. some of the Japanese communities affected by the 2011 tsunami). Yet, it could be argued that such extremely vulnerable communities should be rare at a time of increased globalisation where almost all communities in the world are closely interconnected and can, at times at least, rely on external help for coping with shocks and disturbances (Duffield, 2012). But the case of Vent shows that even in wealthy European countries, and within a community that has many relatively wealthy and well-connected residents, tipping points towards vulnerability are never far.

Sixth, the spectre of climate change may prove particularly damaging for high Alpine communities such as Vent, although a longer autumn season may bring some benefits both with regard to ecotourism/mountaineering and farming (Fuchs, 2009; Luthe et al., 2012; Hill, 2013; Koch and Erschbamer, 2013). The future of Vent nonetheless looks relatively bleak in light of continuing social and natural challenges, and current trends suggest that community resilience may decline further in the mid- to long-term future from an already relatively precarious basis of 'moderate' resilience. Communities such as Vent were poor mountain communities for most of their existence, and the question needs to be asked whether the tourism boom and relative wealth of the past few decades was only a brief 'blip' only to be followed by impoverishment (and partial collapse?) of the community in the near future? Above discussion has highlighted that key decisions will need to be taken soon to safeguard community survival, although this appears difficult in light of a weakly developed political domain. Although Vent appears to be more multifunctional in its economic activities than neighbouring communities, further diversification of the economy is urgently needed, and the above-mentioned failure of the community to agree on how to capitalise on the discovery of 'Ötzi the iceman' may continue to haunt the community for decades to come as multifunctional communities that can draw on multiple strands of economic activity tend to be more resilient (Wilson, 2010). In addition, and building on critical studies on social memory and resilience (Olick and Robbins, 1998; Wilson, 2015), it is evident that more incentives need to be found to keep young people in the village and for passing on skills and knowledge across the generations. This should be combined with revitalising the 'dead' season which is increasingly leading to seasonal outmigration and an attrition of community social networks. A climate change-induced longer autumn season may provide some benefits in this regard in the long term. Improved economic and political collaboration with other Ötztal communities is also urgently needed to prevent further marginalisation of Vent within valley-wide stakeholder networks. Finally, accepting that climate change is happening, and rapidly addressing associated challenges (e.g. afforestation, diversification of tourism, improved water management), may be crucial ingredients for ensuring that Vent remains a resilient community able to face future shocks and challenges.

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